

FIGARO Inspection System for Detecting Concealed Nuclear Materials

Transportable inspection system detects concealed nuclear materials regardless of shape, size, or chemical form

APPLICATIONS

- Border crossings
- Airports
- Train stations
- Bus, ferry, and ship terminals
- Nuclear facility security checkpoints

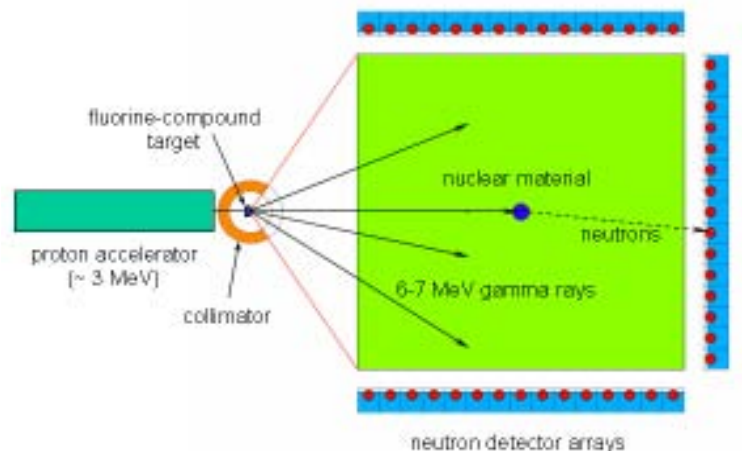
BENEFITS

- Easily transportable for rapid deployment
- High sensitivity ensures small amounts of material are detected, even in shielded containers
- Eliminates false positives through good signal-to-noise ratio
- Safe
- Economical

LINKS TO ONLINE INFORMATION

[http://www.anl.gov/Science and Technology/factsheets/r19-02.pdf](http://www.anl.gov/Science%20and%20Technology/factsheets/r19-02.pdf)

FIGARO (Fissile Interrogation using Gamma Rays from Oxygen) is a technique developed by Argonne National Laboratory to detect concealed nuclear materials at critical locations such as security checkpoints and border crossings. **FIGARO** uses a compact, low-energy proton accelerator to generate gamma rays to inspect large, dense objects such as packages, luggage, and shipping containers for the presence of fissile materials such as uranium and plutonium as well as non-fissionable nuclear materials such as beryllium and lithium-6.



Argonne's FIGARO system directs high-energy gamma rays into packages, luggage, and shipping crates (like the air cargo container pictured) to detect the presence of smuggled nuclear materials

In laboratory tests, **FIGARO** showed selectivity in generating signals from only the target materials and sensitivity in detection of small quantities. In other experiments, **FIGARO** proved resistant to gamma-ray and neutron shielding countermeasures. **FIGARO** obtained detectable neutron counts, even for depleted uranium samples shielded with both gamma ray (copper, lead) and neutron (polyethylene, Lucite®) shielding materials.

OVERVIEW: Argonne Homeland Security Technologies

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FIGARO is highly effective because it (1) produces gamma rays that can easily penetrate large dense objects and (2) generates little or no signal from common cargo materials, which reduces the false alarm rate. Radiation dose to the inspected object is minimized by efficient use of the interrogating and signature radiation. Inspected items do not retain any residual radioactivity. When powered down, **FIGARO** does not pose a radiation hazard to workers who operate or transport the system.

FIGARO can be built entirely from commercially available components. Depending on configuration, a single proton accelerator can serve multiple interrogation portals at an operation site.

ABOUT ARGONNE TECHNOLOGY TRANSFER

Argonne National Laboratory is committed to developing and transferring new technologies that meet industry's goals of improving energy efficiency, reducing wastes and pollution, lowering production costs, and improving productivity.

Argonne's industrial research program, comprised of leading-edge materials research, cost-saving modeling, and unique testing and analysis facilities, is providing solutions to the challenges that face U.S. manufacturing and processing industries.

